

# **Installation Note**

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**Agilent Technologies ESG-D Series Signal Generators  
Replacement Kit for Option H99 (Rev. A) Output Board  
Kit Part Number E4400-60228**

**Models: E4430B, E4431B, E4432B and E4433B**



Part Number E4400-90377

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**Notice**

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## E4400-60228 Replacement Kit

Use this replacement kit to supplement the Option H99 (Revision A) A9 Output Board, part number E4400-60155, with the Option H99 (Revision B) A9 Output Board, part number E4400-60188. Perform this procedure in its entirety and in the order presented.

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**IMPORTANT** This kit requires extensive signal generator adjustments and performance tests. Due to this, it is highly recommended that the installation of this kit be performed by an Agilent Technologies service center.

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Product Affected: . . . . .	ESG-D Series Signal Generators
Serial Numbers: . . . . .	All
To Be Performed By: . . . . .	(X) Agilent Technologies Service Center (X) Personnel Qualified by Agilent Technologies (X) Agilent Technologies personnel on-site
Estimated Installation Time: . . . . .	1.0 hours
Estimated Adjustment Time: . . . . .	8.0 hours
Estimated Performance Test Time: . . . . .	7.0 hours

## Parts List

Item	Quantity	Description	Part Number
1	1	A9 Output Board Assy H99	E4400-60188
2	1	Replacement Kit Firmware CD-ROM	E4400-60230
3	1	ESG Service Support Software (changes cal arrays on A14 motherboard)	E4400-10006
4	1	Manual Supplement, Option H99 (Revision B)	E4400-90376
5	1	Installation Note	E4400-90377

## Tools Required

- T-8 TORX screwdriver
- T-15 TORX screwdriver
- T-20 TORX screwdriver

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<b>WARNING</b>	<b>Before you disassemble the signal generator, turn the power switch off, and unplug the signal generator. Failure to unplug the signal generator can result in personal injury.</b>
<b>CAUTION</b>	Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation.

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# Verifying the Functionality of the Signal Generator

This procedure verifies that the signal generator powers up and that the internal instrument check identifies no errors.

1. Turn on power to the signal generator by pressing the power switch. The green LED will light. Let the signal generator warm up for at least 5 minutes.

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**NOTE** For signal generators with Option 1E5, ERROR 514, Reference Oven Cold occurs when you first connect the signal generator to AC line power. The OVEN COLD annunciator and the ERR annunciator both turn on. The OVEN COLD annunciator automatically clears after approximately 5 minutes. You *cannot* clear the error queue however, until the OVEN COLD annunciator turns off.

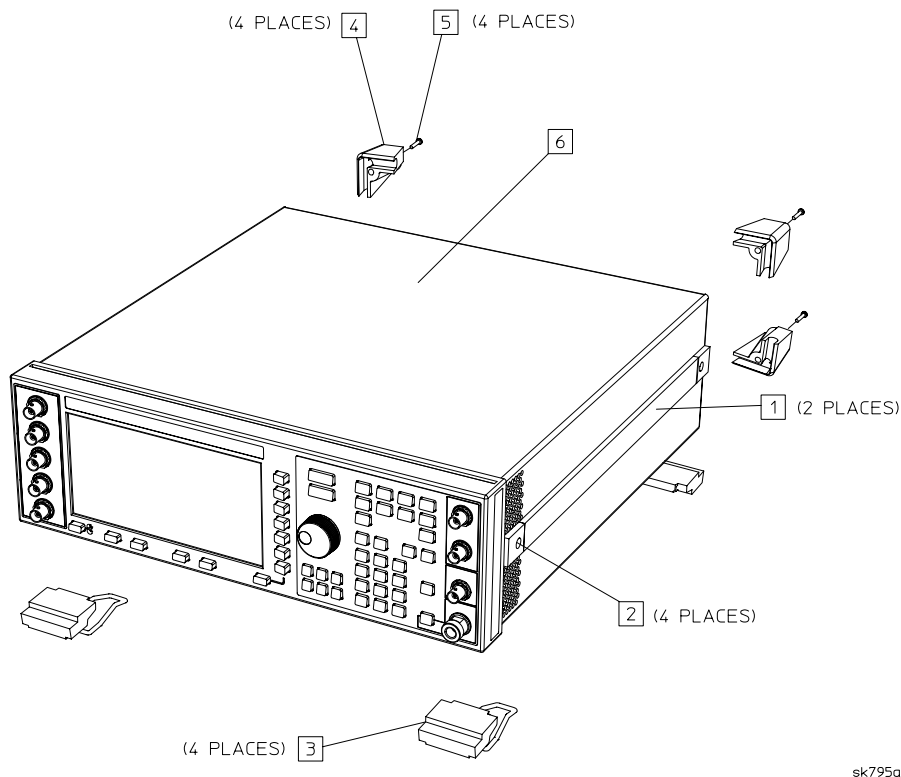
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2. Cycle the power to the signal generator. The green LED should again be lit and the signal generator performs a check.
3. When the display is lit, check to see if the ERR annunciator is on.
4. If the ERR annunciator is on, review the error messages in the queue by pressing **Utility > Error Info**. The first error message in the queue is shown in the text area of the display. Refer to the ESG Family error messages guide for information about the error message.  
  
If there is more than one error message (each message will be designated as 1 of *n*), press **View Next Error Message** until you have seen all of the messages.
5. After you have resolved all of the error messages, press **Clear Error Queue(s)** to delete the messages. Then restart this procedure at step two.

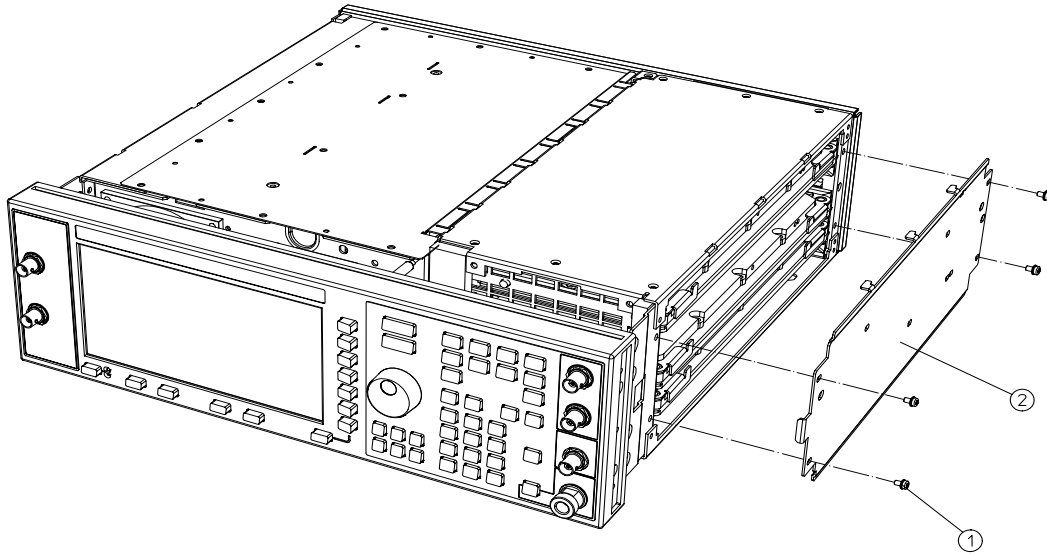
# Removing the Chassis Side Cover

1. Turn the signal generator's power switch off, and unplug the signal generator.
2. Refer to [Figure 1](#). Remove the two strap handles (item 1, one on each side of the signal generator) by loosening and removing the two screws (item 2) on each handle.
3. Remove the four bottom feet (item 3).
4. Remove the four rear feet (item 4) by removing the four screws (item 5).
5. Slide the signal generator cover (item 6) off the back of the signal generator.
6. Refer to [Figure 2](#). Remove the 4 screws (item 1) that secure the chassis side cover (item 2).
7. Remove the side cover by sliding it towards the front of the signal generator, tilt it outwards, and lift it out.

**Figure 1 Exterior Cover Removal**



**Figure 2**                    **Side Chassis Cover Removal**



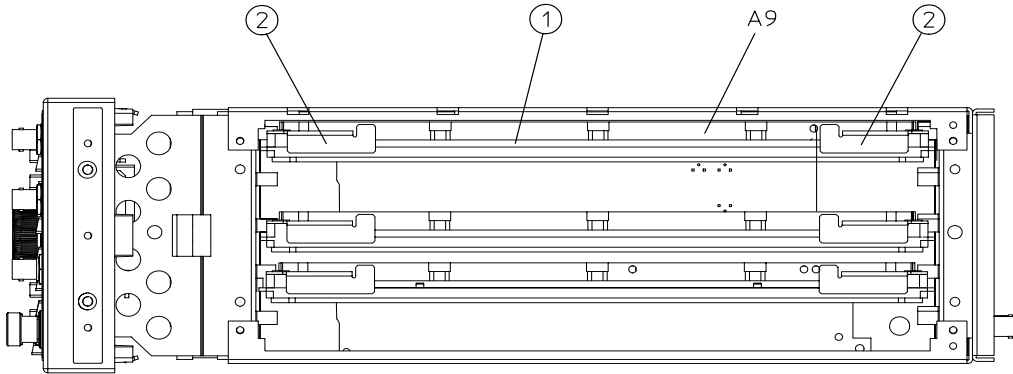
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# Removing and Installing the A9 Output Board

## Removing E4400-60155 A9 Output Board

Refer to [Figure 3](#). Remove the A9 Output Board (item 1) by simultaneously pulling on the left and right extractors (item 2) and finish by removing the board.

**Figure 3** A9 Output Board



ESG-D Series

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## Installing E4400-60188 A9 Output Board

1. Refer to [Figure 3](#). Line up the A9 Output Board (item 1) with the top rails (location of the previous A9 board), extend the left and right extractors (item 2) outwards, and slide the board in until it stops.
2. Simultaneously push the left and right extractor handles in until they are flush with the board. Slight resistance will be felt while the board is being seated.
3. Refer to [Figure 2 on page 7](#). Install the chassis side cover (item 2) by placing it in position and sliding it towards the rear of the signal generator's chassis. Ensure that the tabs are seated.
4. Install the four retaining screws (item 1) and torque them to 9 in lbs.



# Completing the Installation

## Installing New Firmware

For this section, refer to the installation note provided with the firmware upgrade kit.

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**NOTE** Due to the installation of the new A9 Output Board, errors may appear when the signal generator is first turned on. These errors should be corrected with the installation of the new firmware.

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1. Install the new firmware.
2. Perform the verification procedure.

## Install Calibration Library Constants

1. Start the ESG\_B Motherboard Utility from the Agilent Service Support software menu.
2. Enter Falcon for the password in the User Information dialog box that appears. Then select OK.
3. Check that the GPIB address and SICL Interface Name fields are correct when the ESG\_B Motherboard Configuration dialog box appears. Enter corrections as needed.

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**NOTE** If the SICL Interface Name field needs to be corrected, ensure that hpib is used with the correct number and not gpib.

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4. Select the Query button and verify the signal generator information that appears. Ensure that H99 shows in the Options field and is also checked off in the Option Configuration area. If it is not, check the signal generator for the proper option configuration.
5. Select the Download button in the Command area to transfer the calibration constants. (The download takes awhile to occur.) The calibration constants are loaded into arrays on the A14 motherboard.
6. Verify that H99 appears in the Options field and has a check mark next to it in the Option Configuration area once the download is completed.
7. Select the Exit button in the Command area to leave the program.

## Perform Adjustments

Refer to the Option H99 (Revision B) manual supplement (included in this replacement kit), Chapter 4, "Post Repair Procedures."

## Reinstalling the Signal Generator Cover

Refer to [Figure 1 on page 6](#).

1. Turn the signal generator off and unplug it.
2. From the back, slide the signal generator cover (item 6) onto the signal generator.
3. Reinstall the four rear feet (item 4) and torque the four screws (item 5) to 21 in-lb.
4. Reinstall the two strap handles (item 1, one on each side of the signal generator) and torque the two screws (item 2) on each handle to 21 in-lb.
5. Reinstall the four bottom feet (item 3).

## **Run Performance Tests**

Refer to the Option H99 (Revision B) manual supplement (included in this replacement kit), Chapter 4, "Post Repair Procedures."

### **Internally Recalibrating the Signal Generator**

1. Press **Preset > Utility > Instrument Adjustments > Hardware Options > Calibrate Selected Items**.
2. Press **Start Calibration and Store Results**. The calibration takes several minutes. During the calibration, a message is displayed indicating the calibration is in progress and showing the percent complete. When the calibration is finished, the Hardware Options menu is returned.